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Relationship between age at menopause and breast ultrasonography results

Menopoz yaşı ile meme ultrasonografi sonuçları arasındaki ilişki

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ABSTRACT

Aim: Menopause, the natural process of women's aging, brings many problems. With menopause, the loss of mammary glandular tissue increases rapidly, and large losses occur in the mammary glands due to atrophy, degeneration, and hyalinization. Ultrasonography (USG) helps to detect these breast changes. This study compared breast USG findings in menopausal cases before and after 40 years.

Material and Method: The files of menopausal patients who applied to the Gynecology and Obstetrics Clinic of Göztepe Prof. Dr. Süleyman Yalçın City Hospital between October 2014 and September 2020 were retrospectively scanned and analyzed. According to the age of patients entering menopause, it was divided into two groups: 1st group under 40 years old and 2nd group over 40 years old. 52 patients in the 1st group (case group) and 67 patients in the 2nd group (control group) were included in the study.

Results: The mean age of the participants in the study was 33.2 in the 1st group and 48.6 in the 2nd group. Body mass indexes (BMI) were 24.8 kg/m² in group 1 and 25.1 kg/m² in group 2. When the breast USG findings were examined, the incidence of cyst formation in the 1st group was found to be statistically significantly higher than in the 2nd group ($p<0.05$), and the incidence of fibroadenoma was found to be significantly higher in the 1st group than in the 2nd group ($p<0.05$).

Conclusion: Menopause is an important period in the life of women. Breast USG can be used as an auxiliary examination for diagnostic purposes. In the present study, the rate of breast masses and malignancies was directly related to menopausal age and especially menopause at older ages.

Keywords: Breast ultrasonography, breast, menopause

ÖZ

Giriş: Kadınların yaşlanmasının doğal süreci olan menopoz, beraberinde pek çok sorunu da getirmektedir. Menopozla birlikte meme bezi dokusu kaybı hızla artar ve meme bezlerinde atrofi, dejenerasyon ve hyalinizasyona bağlı olarak büyük kayıplar meydana gelir. Ultrasonografi (USG) bu meme değişikliklerinin tespit edilmesine yardımcı olur. Bu çalışmada menopozal olgularda 40 yıl öncesi ve sonrası meme USG bulguları karşılaştırıldı.

Gereç ve Yöntem: Göztepe Prof. Dr. Süleyman Yalçın Şehir Hastanesi Kadın Hastalıkları ve Doğum Kliniği'ne Ekim 2014-Eylül 2020 tarihleri arasında başvuran menopozal hastaların dosyaları retrospektif olarak taranarak analiz edildi. Menopoza giren hastaların yaşlarına göre 1. grup 40 yaş altı ve 2. grup 40 yaş üstü olmak üzere iki gruba ayrıldı. 1. grupta (olgu grubu) 52 hasta ve 2. grupta (kontrol grubu) 67 hasta çalışmaya dahil edildi.

Bulgular: Çalışmaya katılanların yaş ortalaması 1. grupta 33.2, 2. grupta 48.6 idi. Vücut kitle indeksleri (BKİ) grup 1'de 24,8 kg/m², grup 2'de 25.1 kg/m² idi. Meme USG bulguları incelendiğinde 1. grupta kist oluşum insidansı istatistiksel olarak anlamlı derecede yüksek bulundu. 2. grup ($p<0.05$) ve fibroadenom insidansı 1. grupta 2. gruba göre anlamlı derecede yüksek bulundu ($p<0.05$).

Sonuç: Menopoz, kadınların hayatında önemli bir dönemdir. Meme USG tanı amaçlı yardımcı muayene olarak kullanılabilir. Bu çalışmada meme kitleleri ve malignite oranları menopoz yaşı ve özellikle ileri yaşlarda menopoz ile doğrudan ilişkilidir.

Anahtar Kelimeler: Meme ultrasonografisi, meme, menopoz

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INTRODUCTION

According to the World Health Organization, menopause is the cessation of menstruation in women that occurs due to the cessation of ovarian follicle activity and ends the pregnancy in women (1). Thus, women are considered menopause when they have at least 12 months of menstrual interruption, unrelated to pregnancy, breastfeeding, or other hormonal disorders (2). Post-menopausal women are projected to increase from 467 million to 1,200 million worldwide by 2030, with the most significant increase in developing countries (3). Menopausal age changes usually occur in the age range of 45-55 years and it changes from country to country (4,5). Hormonal changes during this period lead to post-menopausal women being prone to cardiovascular disease (CVD), bone complications, and an increased risk of developing breast cancer and endometriosis (2,6,7). Among the most important problems for women before and after menopause are breast lumps and cysts, and according to estimates, today, one in six women undergoes a biopsy due to breast problems (3,5,8).Most examinations and biopsies are performed on individual breast masses found by patients, physicians, or mammograms (6). The nature of these masses is often benign, self-limiting, and in some cases, malignant. Among benign cases, the most common causes of breast masses include fibrocystic changes, fibroadenoma, breast trauma, and infections (3). Cases such as mammary duct ectasia are also in the category of benign masses, but in terms of prevalence, they are much lower and less common (9). Malignant breast masses and lesions are much less common than benign cases and include primary breast cancer and cases of breast metastasis (6). Cases of benign breast masses can be divided into groups without hyperplasia, atypical hyperplasia, and non-atypical hyperplasia (5-8). Cases without hyperplasia, such as fibrocystic changes and simple cysts, are not associated with an increased risk of breast cancer (9,10).

Fibrocystic changes are a finding of unknown cause and are very common in adults. The exact prevalence of this disease is not known, but in some studies, this rate has been reported to be more than 50%. Cysts also increase over time until menopause and decrease abruptly (4,6,8). Atypical hyperplasia includes conditions such as intraductal papilloma and fibroadenoma, which slightly increase the risk of breast cancer (7). Fibroadenoma is an often asymptomatic lesion in the examination of rubbery and mobile consistency, with a variable size of about 1 to 10 cm, and after menopause, it increases in size (3,7,8).

Some studies consider menopausal age a health indicator, so understanding its causes may have important epidemiological and clinical implications (10). Identifying the factors associated with early and late menopause is important because menopausal age is related to the risk of developing several chronic diseases such as CVD, breast and uterine cancer, and osteoporosis (11). Women with early menopause are at risk for CVD (4,6,8) and osteoporosis (4,6,9), while women with late menopause are at risk for breast (2,4,5) and uterine cancers (3). Socio-demographic factors and reproductive and behavioral characteristics are known as menopausal-related factors (7-9). Therefore, with the annual increase in the number of post-menopausal women and the problems mentioned, it seems necessary to conduct several studies in this field. Thus, according to the above, the present study aims to investigate the relationship between age at menopause and breast ultrasonography (USG) results.

MATERIAL AND METHOD

The study was carried out with the permission of İstanbul Medeniyet University Göztepe Training and Research Hospital Clinical Researches Ethics Committee (Date:13.01.2021, Decision No:2021/0040). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Due to the study's retrospective nature, the stage of obtaining informed consent from patients was omitted.

A total of 119 patients were enrolled at Gynecology and Obstetrics Clinic Göztepe Prof. Dr. Süleyman Yalçın City Hospital between October 2014 and September 2020. Participants ranged in age from 25 to 54 years. The inclusion criteria were: (1) the woman between the ages of 20 and 55. The exclusion criteria were: (1) pregnant women and women in the breastfeeding period; (2) women who received infertility treatment; (3) having diabetes, thyroid dysfunction, and systemic diseases; (4) smoking and using alcohol.

Patients' data were obtained from their records and analyzed retrospectively. The study participants were divided into two groups. The women who had normal menopause were included in the control group (n:67), and the women with premature menopause were included in the study group (n:52).

Statistical Analysis

Data were analyzed, tabulated, and subjected via the SPSS (version 26). The continuous data were displayed as mean±SD. At the same time, categorical data were illustrated as percentages and numbers. The Kolmogorov-Smirnov test of normality was utilized to test the normality hypothesis. Based on the test results, Man Whitney, Kruskal Wallis, and Chi-square test were used. A p-value of <0.05 was regarded as statistically

significant.

RESULTS

This study sample included 119 participants (52 cases and 67 control). The participants' BMI and mean age were 22.71±1.94 and 41.46 years ±7.41, respectively. The mean age of the first period was 11.24±1.02 years. The mean age at menopause was 38.10±6.74. The breast USG findings showed that no cyst was found in 28 (23.5%) subjects, a cyst was detected in 50 (42%) subjects, and cystic changes were found in 21 (17.6%) subjects. In 11 (9.2%) and 9 (7.5%) subjects, solid lesions and fibroadenoma were detected. **Table 1** shows the explanatory information of the variables.

Table 1. Explanatory information of the variables

Variable	N	Min	Max	Mean	SD
Age(yr)	119	25.00	54.00	41.46	7.41
BMI	119	18.00	28.00	22.71	1.94
The age the first period (yr)	119	9.00	14.00	11.24	1.02
Age at menopause (yr)	119	25.00	46.00	38.10	6.74
Breast USG		**Frequency**			**Percent**
No cyst		28			23.5
Cyst		50			42
Cystic changes		21			17.8
Solid lesion		11			9.2
Fibroadenoma		9			7.5

Min: Minimum, Max: Maximum

Table 2 shows the comparison of research variables for the two groups. It was expected that variables age and age at menopause were significantly different. They are reported only because of the mean information in each group. There was no statistically significant difference between the study group and controls regarding BMI (p value>0.05). A statistically significant difference was observed between the two groups regarding the age of the first period (p value=0.012). The control group had higher age (11.47) than the case group (10.94). The table also shows that 76% had breast-related complications.

Table 2. Distinction of laboratory results of two groups

Variable	Categories	Normal menopause (n=67) (Mean±SD) or n (%)	Premature menopause (n=52) (Mean±SD) or n (%)	P value
Age(yr)		47.47±2.13	33.71±3.56	0.000*
BMI		22.91±1.81	22.46±2.10	0.158
The age the first period (yr)		11.47±1.03	10.94±0.93	0.012*
Age at menopause(yr)		43.62±1.28	31±3.41	0.000*
Number of births				0.000**
	0	5(7.4)	34 (65.3)	
	1	42 (62.6)	14 (26.9)	
	2	17 (20.8)	4 (7.6)	
	3	3 (4.4)	0 (0)	

* Mann–Whitney U test, **Pearson Chi-Square Test

As **Table 2** shows, the number of births in the case group and controls was statistically significantly different (p value<0.05). The information about the subjects' mean age of menopause is shown in **Figure 1**.

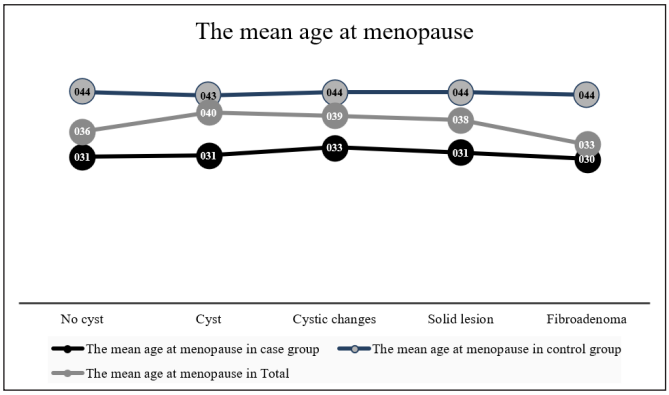

Figure 1. The mean age at menopause in breast USG finding between two groups

Table 3 shows the comparison of groups regarding breast USG results.

Table 3. Relationship between groups and breast USG results

Variable	Categories	Normal menopause (n=67) or n (%)	Premature menopause (n=52) or n (%)	P value	P value
Breast USG					0.014
	No cyst	11(16.4)	17(32.6)	0.038	
	Cyst	36(53.7)	14(26.9)	0.003	
	Cystic changes	12(17.9)	9(17.3)	0.932	
	Solid lesion	6(8.9)	5(9.6)	0.902	
	Fibroadenoma	2(2.9)	7(13.4)	0.032	

*Pearson Chi-Square Test

As shown in **Table 3**, the case group and controls had a statistically significant difference in terms of breast USG findings (p value<0.05). These differences were observed in the normal menopause group having more cyst (p value=0.003) and the premature menopause group having more fibroadenoma (p value=0.032). This information is shown in **Figure 2**.

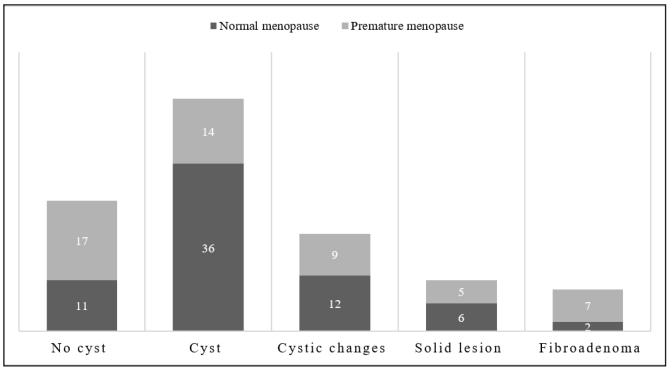

Figure 2. Breast USG finding prevalence in case and control group

DISCUSSION

Breast lumps are common in pre-and post-menopausal ages and are a common complaint among women. About 40% of the reasons for women to go to diagnostic centers are breast diseases (10, 11). Most of these lumps are benign but can be a critical and warning sign of malignancy in some cases. According to previous studies, 11% of people with breast lumps complaints have had breast cancer and malignancy. In general, the prevalence of benign breast pathologies has been reported to be 2 to 8 times higher than malignant cases (6,8,10).

In the present study, 119 records of women referred to our center with various complaints and symptoms were examined to extract breast USG findings and examine these findings' relationship with the prevalence of breast masses in the two groups of early menopause and normal menopause. These results indicate the importance of breast masses, especially in the post-menopausal period, when malignancies are the more common breast complications (10). The results showed that the most common pathological findings in breast USG in the group of early menopause were cyst (26.9%) and cystic changes (17.3%), respectively. For the normal menopausal group, the most common pathologies were also cyst (53.7%) and cystic changes (17.9%). Our results also showed a significantly higher rate of fibroadenoma in women with early menopause (p value=0.032), which is consistent with previous results (12-14).

In this study, the high prevalence of fibroadenoma in women with early menopause was consistent with the results of many studies that indicated that fibroadenoma is the most common breast mass among women with early menopause (14-16). However, fibroadenoma is the second most common post-menopausal woman (17). The most common benign breast masses in previous studies were cysts (13,15,17). In the present study, cystic masses were also at the top of benign masses, consistent with other studies in this field.

It is also important to note that the overall rate of malignant breast masses in post-menopausal women is much higher than in women of childbearing age, which is evidence that hormonal cycles during fertility have a protective effect against malignancies (17,18). The rate of breast cysts in women who have menstrual cycles is significantly higher than in menopausal women due to the high impact of cysts on hormonal cycles (14,15). This phenomenon is significantly reduced in post-menopausal women but remains in early-menopausal women (16,17). Our results are also consistent with these findings.

In the present study, the rate of cystic changes and solid lesions in women were similar between the two groups. However, the number of cysts is more common in the group with normal menopause. The present study results show a significant relationship between the number of cysts and menopausal status in women; Its shows that the cyst prevalence is significantly higher in women with normal menopause than in women with early menopause. It should be noted that fibrocystic changes are a lesion without hyperplasia and an increased risk of malignancy (15,16). This finding can be justified based on related studies because the average age of post-menopausal women is usually high, and according to estimates, age over 50 years is directly related to an increase in breast cancer in women (18-20). Thus, it can be concluded that menopause at a younger age is associated with a lower risk of cysts. These findings are consistent with the results of previous studies (21,22).

It is important to pay attention to the results of this study because over the past few decades, due to the increase in life expectancy and the number of postmenopausal women (14,17), the age parameter, which is one of the most important indicators of breast cancer, has increased significantly. In the present study, the rate of breast masses and malignancies was directly related to menopausal age and especially menopause at older ages. Finally, regular check-ups are recommended at appropriate intervals, especially in women over 50 for cysts and women with early menopause for fibroadenoma. Among the limitations of this study are the small number of samples and the single center of study information. Studying more samples and considering more diverse ethnic factors is necessary to get more comprehensive results.

CONCLUSION

Menopause is an important period in the life of women. Breast USG can be used as an auxiliary examination for diagnostic purposes. In the present study, the rate of breast masses and malignancies was directly related to menopausal age and especially menopause at older ages. Regular check-ups are recommended at appropriate intervals, especially in women over 50 for cysts and women with early menopause for fibroadenoma.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of İstanbul Medeniyet University Göztepe Training and Research Hospital Clinical Researches Ethics Committee (Date:13.01.2021, Decision No:2021/0040).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

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